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Evaluation of Associated Factors with Children's Breakfast Attitudes and Self- Efficacy for Healthy Eating

Çocukların Kahvaltı Tutumları ve Sağlıklı Beslenme Öz Yeterliliği ile İlişkili Faktörlerin Değerlendirilmesi

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ABSTRACT

This study aimed to evaluate the breakfast attitude and healthy eating self-efficacy status of children and the factors affecting them (such as gender, BMI, and mindful eating). The study included 505 children (47.9% boys, 52.1% girls) with a mean age of 9.7±0.77 years. Data were obtained using the survey and a face-to-face interview method. The questionnaire includes general information, anthropometric measurements, Breakfast Attitudes Questionnaire (BAQ), Self-Efficacy for Healthy Eating Questionnaire (SEHE), and Mindful Eating Questionnaire for Children (MEQ-C). While 46.9% of children have normal BMI, 42.2% are overweight or obese. 39.6% of children reported skipping at least one main meal or snack. Of those who skipped meals, 19.0% skipped breakfast, and 60.5% skipped at least one of the snacks. The BAQ score was higher in girls ($p=0.003$); lower in overweight/obese children ($p<0.05$). Those who did not skip breakfast had higher SEHE scores ($p=0.020$). When the factors affecting the scores obtained from BAQ were evaluated with multiple linear regression analysis, child BMI, Mindless eating score affected BAQ score negatively, father education duration, mother and father BMI, Awareness, and SEHE scores affected BAQ score positively. Awareness and BAQ scores were found to affect SEHE positively. Our findings indicate that breakfast attitudes are related to healthy eating self-efficacy, mindful eating, and BMI in children and may also be related to parents' educational status and BMI. These results show that it is very important to provide education by nutritionists in order to improve children's breakfast attitudes, healthy eating self-efficacy and mindful eating skills.

Keywords: Breakfast Attitude, Childhood, Healthy Eating Self-Efficacy, Mindful Eating.

ÖZ

Bu çalışmanın amacı, çocukların kahvaltı tutumu ile sağlıklı beslenme öz-yeterlik durumlarını ve bunları etkileyen faktörleri (cinsiyet, BKİ, yeme farkındalığı gibi) değerlendirmektir. Çalışmaya yaş ortalaması 9,7±0,77 olan 505 çocuk (%47,9 erkek, %52,1 kız) dahil edilmiştir. Veriler anket aracılığıyla yüz yüze görüşme yöntemi kullanılarak elde edilmiştir. Anket içeriğinde genel bilgiler, antropometrik ölçümler, Kahvaltı Tutumu Ölçeği (KTÖ), Sağlıklı Beslenme için Öz-Yeterlilik Ölçeği (SBÖY) ve Çocuklar için Yeme Farkındalığı Ölçeği (YFÖ-Ç) yer almaktadır. Çocukların %46,9'unun BKİ değerleri normal aralıktadır, %42,2'si fazla kilolu veya obezdir. Çocukların %39,6'sı en az bir ana öğünü veya ara öğünü atladığını bildirmiştir. Öğün atlayanların %19,0'ı kahvaltıyı, %60,5'i ara öğünlerden en az birini atladığı saptanmıştır. KTÖ puanı, kızlarda daha yüksekken ($p=0,003$); fazla kilolu/obez çocuklarda daha düşüktür ($p<0.05$). Kahvaltıyı atlamayanların SBÖY puanları daha yüksek bulunmuştur ($p=0,020$). KTÖ'dan alınan puanları etkileyen faktörler çoklu doğrusal regresyon analizi ile değerlendirildiğinde, çocuğun BKİ değeri ve Bilinçsiz yeme skoru negatif; baba eğitim süresi, anne ve baba BKİ, Farkındalık ve SBÖY skorları pozitif yönde etkilemiştir. Farkındalık ve KTÖ ölçek skorlarının, SBÖY'yi pozitif yönde etkilediği bulunmuştur. Sonuçlarımız, çocuklarda kahvaltı tutumlarının sağlıklı beslenme öz yeterliliği, yeme farkındalığı ve BKİ ile ilişkili olduğunu ve ayrıca ebeveynlerin eğitim durumu ve BKİ değerleri ile ilişkili olabileceğini göstermektedir. Bu sonuçlar, çocukların kahvaltı tutumlarını, sağlıklı beslenme öz yeterliklerini ve yeme farkındalığı becerilerini geliştirmek için beslenme uzmanları tarafından erken dönemde eğitim verilmesinin çok önemli olduğunu göstermektedir.

Anahtar kelimeler: Kahvaltı Tutumu, Çocukluk Dönemi, Sağlıklı Beslenme Öz Yeterliliği, Yeme Farkındalığı.

Approval was obtained from the Erzurum Technical University Ethics Committee and Erzurum Provincial Directorate of National Education to conduct the research.

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INTRODUCTION

According to the World Health Organization (WHO), the prevalence of obesity worldwide has nearly tripled in the last 40 years. Also, the prevalence of obesity in children increased tenfold between 1975 and 2016.[1] In the WHO European Regional Obesity Report 2022, Turkey ranks first among European countries with an obesity rate of 32.1%.[2] Childhood Obesity Surveillance Initiative- COSI-TUR-2013 determined that 8.3% of 2nd-grade in 216 schools (161 urban, 53 rural) in 67 provinces across Turkey were obese.[3] In 2016, this percentage was 9.9%.[4] In Turkey, the prevalence of childhood obesity tends to increase.

Inactivity, increased screen time, limited opportunities for physical activity, and preventing children from playing outside are known to lead to the development of obesity.[5] Children with unhealthy eating habits are more likely to become fat adults in the future.[5] Therefore, it is essential to gain and maintain healthy eating behaviors in childhood.[6, 7] For this reason, children must gain self-efficacy skills for healthy eating. Self-efficacy gives individuals the confidence they need to develop healthy behaviors. Significantly, low self-efficacy for healthy eating in childhood is associated with obesity.[8, 9]

A key aspect of healthy eating self-efficacy is avoiding meal skipping and having adequate and balanced nutrition. The first and most important meal of the day is breakfast.[10] Consumption of a healthy breakfast is a habit that should be maintained throughout life. Skipping breakfast or consuming unhealthy snacks instead of breakfast in children causes health problems and decreases academic learning and achievement.[6, 11, 12] Among the nutritional risk factors that cause health problems in children are skipping breakfast, low consumption of vegetables and fruits, and a preference for unhealthy foods.[13] In meta-analysis studies, it has been shown that skipping breakfast increases the risk of obesity.[14, 15] The most important reasons for obesity are the high dietary energy intake in children who skip breakfast and cause inadequate diet quality.[14, 16]

Currently, mindful-based practices have been considered as a promising for weight management approach.[17] Mindful eating focuses on the food to be consumed at a specific moment without environmental influences and judging food choices by recognizing why and how eating behavior exists rather than what is eaten, accepting the concept of physiological hunger-fullness, and being conscious of the effects of emotions and thoughts.[18] By paying greater attention to eating behavior, internalizing the food consumed, and decreasing susceptibility to thoughts and emotions during food intake, one can make healthier food selections.[17]

The aim of this study was to evaluate the breakfast attitude and healthy eating self-efficacy status of children and the factors affecting them (such as gender, BMI, and mindful eating).

MATERIAL AND METHOD

Study Design and Participants

This study was carried out in primary and secondary schools in Erzurum, with 505 children aged 8-11. The data were gathered through face-to-face interviews using a survey between October 2022 and December 2022. Children with no chronic and/or psychological issues, with no diagnosis of eating disorders, and who complied with joining the study were included in the research. Participants were selected by simple random sampling from randomly selected schools in Erzurum (one of the metropolitan cities of Turkey).

Ethical Considerations

Approval was obtained from the Erzurum Technical University Ethics Committee (Meeting Number:8, Decision No:7, and Date 29.08.2022) and Erzurum Provincial Directorate of National Education (Date 26.09.2022) to conduct the research. Permission was obtained from the authors of the questionnaires used in the study. The research was carried out in compliance with the policy set out in the Declaration of Helsinki, and informed consent in written form was obtained from the parents and child assent was obtained.

Measures

Data were obtained using the survey and a face-to-face interview method. The questionnaire includes general information, anthropometric measurements, Breakfast Attitudes Questionnaire, Self-Efficacy for Healthy Eating Questionnaire, and Mindful Eating Questionnaire for Children.[17, 19, 20]

Breakfast Attitudes Questionnaire

Breakfast Attitudes Questionnaire (BAQ) was developed by Tapper et al. in 2008 to measure children's attitudes toward breakfast.[21] The Turkish validity and reliability of the scale was performed by Bektaş et al.[19] The questionnaire examines attitudes, beliefs, and behaviors linked to breakfast. The scale is assessed on a 5-likert scale (agree a lot/agree a bit/don't agree or disagree/disagree a bit/disagree a lot).[19] There is no cut-off point of the scale. The first, twelfth, and thirteenth scale items are reverse scored. Higher scores suggest more positive attitudes regarding breakfast, while lower scores reflect a negative attitude. Cronbach's alpha for the scale is 0.82.[19]

Self- Efficacy for Healthy Eating

Self-Efficacy for Healthy Eating (SEHE) was developed by Story et al. to be used to assess children's self-efficacy for healthy eating.[22] The Turkish validity and reliability of the scale was done by Kabasakal et al.[20] The scale includes items about choosing healthy foods. The scale is a 3-Likert-type scale consisting of 9 items and one dimension. For each item, there are "not at all difficult," "somewhat difficult," and "very difficult" options. In the evaluation of the scale, the scores obtained for all items are summed as 0 points for each "Not at all difficult" option, 1 point for each "somewhat difficult" option, and 2 points for each "very difficult" option. A score between 0 and 18 can be obtained on the scale. There is no reverse-coded scale item. An increase in the scale score indicates a further increase in self-efficacy for healthy eating. Cronbach's alpha for the scale is 0.67.[20]

Mindful Eating Questionnaire for Children

The Mindful Eating Questionnaire developed by Framson et al., (2009) and was adapted for children by Hart et al. (2018).[23, 24] The Turkish reliability and validity study of the scale was conducted by Kocaadam-Bozkurt et al. (2022).[17] The scale includes two subscales: Mindless eating (Cronbach's alpha=0.82) and Awareness (Cronbach's alpha=0.80). The scale is scored on a 4-likert type (1 = never/rarely; 2 = sometimes; 3 = often; 4 = usually/always). Increased scores on the Awareness subscale shows a higher frequency of "mindful" eating habits. For the Mindless eating subscale, higher scores on this factor indicate more "mindless" eating behaviors. For each factor, the scores for each item are calculated and divided by the number of items to access a mean score.[17]

Anthropometric measurements

Measurements regarding the height and weight conducted by the researcher following the techniques described by Lohman et al., (1988).[25] The World Health Organization (2007) growth standards and the WHO AnthroPlus software (version 1.0.4, February 2011) program were applied to evaluate weight, height, Body Mass Index (BMI) and Z-scores. The measurements were categorized according to the Z-score junctions.[26] The body weight and height of the parents were based on their self-reports. For parents, Body Mass Index (BMI) value was calculated by dividing the body weight by the square of the height. Body mass index below 18.50 kg/m^2 was classified as

underweight, 18.50–24.99 kg/m^2 as normal, 25.0–29.99 kg/m^2 as overweight, and above 30.0 kg/m^2 as obese.[27]

Data Analysis

The data was analyzed using the SPSS 22.0. Normality test was performed to determine whether the parametric test assumptions were met. In the statistical evaluation of the data, continuous variables were expressed as mean ($\bar{x}$) and standard deviation (SD), and categorical variables were expressed as number (n) and percentage (%). T test, Mann Whitney U test, ANOVA or Kruskall Wallis test were applied to find value differences between groups. The Spearman or Pearson correlation coefficient was conducted to analyze the correlation between the parameters. Multiple linear regression analyzes were used to evaluate factors associated with BAQ and SEHE. The statistical significance level was set at $p<0.01$ and $p<0.05$.

Limitations

Study sample is limited to Erzurum province.

RESULTS AND DISCUSSION

The study included 505 children (47.9% boys, 52.1% girls) with a mean age of 9.7±0.77 years. While 46.9% of children have normal BMI, 42.2% are overweight or obese. Most parents are overweight or obese (mother 50.9%, father 65.9%). 39.6% of children reported skipping at least one main meal or snack. Of those who skipped meals, 19.0% said they skipped breakfast, and 60.5% skipped at least one of the snacks. The scores of the children on Mindless eating, Awareness, BAQ, and SEHE scales were determined as 1.8±0.63, 2.8±0.65, 7.4±2.27 and 9.2±3.66, respectively (Table 1).

Table 1. General Characteristics of the Participants (n:505)

	n	%
Gender		
Boys	242	47.9
Girls	263	52.1
Child's BAZ classification		
Underweight	55	10.9
Normal	237	46.9
Overweight/Obese	213	42.2
Mother's BMI classification		
Underweight	-	-
Normal	248	49.1
Overweight/Obese	257	50.9
Father's BMI classification		
Underweight	-	-
Normal	172	34.1
Overweight/Obese	333	65.9
Skipping meals		
Yes	200	39.6
No	305	60.4
	X̄±SS	
Child's Age	9.7±0.77	
Mother's Age	37.2±5.78	
Father's Age	40.5±5.98	
Mother education duration	10.0±3.80	
Father education duration	10.2±3.23	
Main meals number	2.8±0.36	
Snacks number	2.7±0.52	
Mindless eating scale	1.8±0.63	
Awareness scale	2.8±0.65	
BAQ	7.4±2.27	
SEHE	9.2±3.66	

BAQ: Breakfast Attitudes Questionnaire; SEHE: Self- Efficacy for Healthy Eating, BMI: Body Mass Index

The BAQ score was higher in girls (p=0.003); lower in overweight/obese children (p<0.05). The BAQ scores of children who skipped breakfast were lower than those who did not skip breakfast, but the difference was not significant (p=0.087). In addition, those who did not skip breakfast had higher SEHE scores (p=0.020). Mindless eating scores were significantly higher in boys, children of parents with less than eight years of education, and overweight/obese children (p<0.05); Awareness scores did not differ according to the groups (p>0.05). However, the Awareness scores of children who did not skip meals were higher than those who skipped meals (p<0.001). (Table 2). There was no difference between the mean BMI values according to the breakfast-skipping status of the children (p>0.05).

Table 2. Comparison of the Scores Obtained from Mindless Eating, Awareness, BAQ and SEHE Scores by Groups

			p	Awareness	p	BAQ	p	SEHE	p
Gender									
Boys	242 (47.9%)	1.9±0.74	**<0.001****	2.7±0.67	0.074	6.9±2.43	**0.003***	9.1±2.48	0.706
Girls	263 (52.1%)	1.6±0.48		2.8±0.62		7.8±3.08		9.3±3.38	
Skipping Meals									
Yes	200 (39.6%)	1.8±0.56	0.297	2.6±0.66	**<0.001****	7.3±3.28	0.688	9.0±3.2	0.573
No	305 (60.4%)	1.7±0.68		2.9±0.62		7.4±3.20		9.3±3.8	
Skipped Breakfast									
Yes	38(7.5%)	1.7±0.43	0.733	2.9±0.70	0.187	7.3±3.3	0.087	9.0±3.77	**0.020***
No	467 (92.5%)	1.8±0.64		2.8±0.64		8.2±2.9		11.6±4.60	
Years of education of the mother									
≤8 years	187 (37.0%)	1.9±0.69	**0.003***	2.7±0.69	0.208	7.1±3.28	0.117	9.4±2.51	0.695
>8 years	318 (63.0 %)	1.7±0.58		2.8±0.62		7.5±3.26		9.1±3.17	
Years of education of the father									
≤8 years	183 (36.2%)	1.9±0.66	**<0.001****	2.8±0.59	0.752	7.2±3.20	0.268	9.3±2.53	0.854
>8 years	322 (63.8%)	1.6±0.59		2.8±0.63		7.5±3.31		9.2±3.26	
Mother's working status									
Working	170 (33.7%)	1.9±0.67	**0.007***	2.8±0.59	0.579	7.2±0.59	0.307	8.6±3.29	0.154
Not working	335 (66.3%)	1.7±0.60		2.8±0.67		7.5±3.22		9.5±3.57	
Father's working status									
Working	466 (92.3%)	1.7±0.61	**<0.001****	2.8±0.63	0.283	7.4±3.21	0.538	9.2±3.82	0.856
Not working	39 (7.7%)	2.2±0.81		2.7±0.82		7.1±3.01		9.0±3.31	
Children' BAZ classification									
Underweight	55 (10.9%)	1.7±0.52[a]		3.0±0.61		8.9±3.02[a]		9.1±3.98	
Normal	237 (46.9%)	1.8±0.66[b]	**<0.001***	2.8±0.60	0.131	7.5±2.93[b]	**<0.001****	9.9±3.21	0.087
Overweight/obese	213 (42.2%)	2.1±0.78[c]		2.8±0.70		6.9±3.58[b]		8.5±3.80	
Mothers' BMI classification									
Normal	248 (34.1%)	1.7±0.59	0.106	2.8±0.61	0.790	7.0±2.85	**0.011***	9.5±3.01	0.397
Overweight/obese	257 (50.9%)	1.8±0.67		2.7±0.70		7.8±0.69		9.0±3.47	

Table 2. (Devamı)

			p	Awareness	p	BAQ	p	SEHE	p
Fathers' BMI classification									
Normal	172 (34.1%)	1.9±0.66	**0.035***	2.7±0.58	0.249	6.6±3.12	**<0.001****	8.4±2.93	0.038
Overweight/obese	333 (65.9%)	1.7±0.62		2.8±0.68		7.8±3.29		9.7±3.67	

BMI: Body Mass Index, BAZ: Body Mass Index-for-age Z score; *$p<0.05$, **$p<0.001$
a,b,c The groups with the same letters within a column are not significantly different according to pairwise comparisons

When the factors affecting the scores obtained from BAQ were evaluated with multiple linear regression analysis (R^2: 0.294); $p<0.001$), it was determined that child BMI, Mindless eating score affected BAQ score negatively, father education duration, mother and father BMI, Awareness, and SEHE scores affected BAQ score positively (Table 3).

Table 3. Multiple Linear Regression Analysis for Children's BAQ Scores

Model	**BAQ**					
	Beta	***Standart Error***	***t***	***p***	***Lower Bound***	***Upper Bound***
Children age (year)	0.071	0.170	0.017	0.676	-0.263	0.406
Children BMI (kg/m^2)	-0.096	0.038	-2.530	**0.006***	-0.170	-0.021
Mother education duration	-0.030	0.134	-0.225	0.822	-0.293	0.233
Father education duration	0.444	0.174	2.549	**0.011***	0.102	0.786
Mother BMI	0.063	0.031	2.014	**0.045***	0.002	0.125
Father BMI	0.073	0.037	1.954	**0.049***	0.000	0.146
Mindless eating score	-0.913	0.213	-4.286	**<0.001****	-1.331	-0.494
Awareness score	1.859	0.213	8.713	**<0.001****	1.440	2.278
SEHE score	0.083	0.020	4.139	**<0.001****	0.043	0.122
				R^2: 0.294; p<0.001		

BMI: Body Mass Index, SEHE: Self- Efficacy for Healthy Eating, *$p<0.05$, **$p<0.001$

Awareness and BAQ scores were found to affect SEHE positively (R^2: 0.146; $p<0.001$) (Table 4).

Table 4. Multiple Linear Regression Analysis for Children's SEHE Scores

Model	**SEHE**					
	Beta	***Standart Error***	***t***	***p***	***Lower Bound***	***Upper Bound***
Age (year)	0.485	0.400	1.213	0.226	-0.301	1.271
Children's BMI (kg/m^2)	-0.041	0.088	-0.469	0.640	-0.214	0.131
Mother education duration	-0.324	0.315	-1.031	0.303	-0.943	0.294
Father education duration	-0.163	0.411	-0.396	0.692	-0.970	0.645
Mother BMI	-0.056	0.074	-0.753	0.452	-0.202	0.090
Father BMI	0.051	0.088	0.557	0.564	-0.122	0.224
Mindless eating score	-0.050	0.500	-0.099	0.921	-1.032	0.933
Awareness score	2.260	0.533	4.237	**<0.001****	1.212	3.309
BAQ score	0.459	0.111	4.134	**<0.001****	0.241	0.677
				R^2: 0.146; p<0.001		

BMI: Body Mass Index, BAQ: Breakfast Attitudes Questionnaire, **$p<0.001$

As a result of this study, the Breakfast Attitude Questionnaire score (BAQ) was higher in girls, negatively correlated with BMI and Mindless scores in children, and positively correlated with Awareness and SEHE scores, mother and father BMI, and father's educational status. It was determined that the healthy eating self-efficacy score (SEHE) was higher in girls and significantly higher in children who did not skip breakfast. Also, the SEHE scores were positively related to BAQ and Awareness scores.

There are many different factors (behavioral, environmental, parental, and social factors) in the etiology of childhood obesity.[28] In this study, it was determined that 46.9% of the children were of normal weight, and 42.2% of them were overweight or obese. In a similar study conducted in this age group, the rate of overweight and obesity was found to be 36.6%.[29]

One of the most important obesity factors is breakfast consumption. It has been determined that the rate of children who skip breakfast varies between 17% and 22%.[30, 31] In this study, 19% of children who skipped meals reported skipping breakfast. Some studies show a relationship between the frequency of skipping breakfast and obesity.[29, 32, 33] Children who skip breakfast tend to skip meals with foods with low nutritional value and high energy density. For this reason, it is thought that skipping breakfast in children causes obesity by causing excessive dietary energy intake and poor diet quality.[34] In this study, there was no difference in BMI values between children who skipped breakfast and those who did not, whereas BAQ scores were significantly lower in obese children. These results show that low attitudes towards breakfast in children may cause obesity.

Factors affecting childhood obesity are family income, traditional family structure, and parental education level.[35] Literature indicates that children of parents with a high level of education consume healthier foods.[36] Parents with higher levels of education are more likely to be aware of healthy eating habits than parents with lower levels of education.[36] According to the literature, our study found that children whose fathers had a higher education level had more positive attitudes toward breakfast. Furthermore, BAQ scores were significantly higher in children of overweight/obese parents. It shows that overweight/obese parents may be more interested in their children's nutrition. In the study, the BAQ score was found to be higher in girls ($p<0.05$), while the Mindless eating score was found to be higher in boys ($p<0.05$). Considering that the mindless eating scale shows unconscious eating behaviors and may adversely affect healthy food preferences, this difference between genders is interesting.

Self-efficacy refers to an individual's self-confidence that s/he can perform a behavior. Healthy eating self-efficacy is the perceived efficacy level of an individual regarding choosing and preferring healthier foods. Therefore, it is an indicator that should be considered in evaluating healthy nutrition.[20] The SEHE score was higher in girls and those who do not skip breakfast. There was a positive relationship between Awareness scores and BAQ scores. Also, those who did not skip breakfast had higher Awareness scores ($p<0.05$). In a study, Awareness scores in children were negatively associated with negative eating behavior.[17] These results show that children with high self-efficacy for healthy eating and high mindful eating scores have higher breakfast attitudes. For this The SEHE score was higher in girls and those who do not skip breakfast. There was a positive relationship between Awareness scores and BAQ scores. Also, those who did not skip breakfast had higher Awareness scores ($p<0.05$). In a study, Awareness scores in children were negatively associated with negative eating behavior.[17] These results show that children with high self-efficacy for healthy eating and high mindful eating scores have higher breakfast attitudes. For this reason, it is very important to provide children with healthy eating habits and mindful eating skills in their early period.

CONCLUSION AND SUGGESTIONS

To the best of our knowledge, this research is the first to evaluate breakfast attitudes and healthy eating self-efficacy in children and the factors affecting them. Our findings indicate that breakfast attitudes are related to healthy eating self-efficacy, mindful eating, and BMI in children and may also be related to parents' educational status and BMI. These results show that it is very important to provide education by nutritionists in order to improve children's breakfast attitude, healthy eating self-efficacy, and mindful eating skills. While girls' breakfast attitude scores were higher, boys' mindless eating scores were higher. Considering that the mindless eating scale shows unconscious eating behaviors and may adversely affect healthy food preferences, this difference between genders is interesting. Further research is needed to explain this difference in scores according to gender.

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